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ABSTRACT

This research report had as its main purpose the derivation of a self-report measure of life satisfaction in retirement through the use of a mathematical technique known as factor analysis. Data on questions which have been used to measure moral, life satisfaction, and preretirement attitudes were collected from 123 retired male workers from a large urban area in California. Theoretical concepts identified by previous workers as being important to life satisfaction in retirement--resolution and fortitude, self-concept, desired versus achieved goals, zest versus apathy, and mood tone--were compared to the item content of each cluster produced in the factor analysis. The results indicated that the theoretical constructs of life satisfaction were evident in the self-report measure, and the measure was accepted as being an indicator of life satisfaction in retirement. (Author)

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A SELF-REPORT MEASURE OF LIFE SATISFACTION IN RETIREMENT

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With the introduction in 1949 by Cavan, Burgess, Havighurst, and Goldhamer of an attitude scale to measure adjustment to aging, researchers in the field of gerontology have spent many hours defining "successful" aging and developing various instruments to measure the phenomenon. Early research, such as that done by Havighurst and Albrecht (1953), relied upon the social acceptability of an older person's behavior as a measure of adjustment. By 1961 this gave way to a newer school of thought where the individual's own evaluations of his aging would be of prime importance -- one in which social participation would have little consequence.

With this criteria in mind, an index was introduced by Neugarten, Havighurst and Tobin (1961), known as the Life Satisfaction Index A (LSIA). The LSIA consisted of twenty questions thought to represent five components of life satisfaction: zest for life as opposed to apathy; congruence between desired and achieved goals; resolution and fortitude as opposed to resignation; optimistic attitudes and mood; and self-concept. This index appears to be the most popular in gerontological research. Recently, the LSIA has been successfully used in a modified form as a self-report measure of life satisfaction (Wood, Wylie, and Sheafor, 1969).

The research report here had as its main purpose the derivation of a self-report measure of life satisfaction in retirement through the use of a mathematical technique known as factor analysis applied to the sample data. In this study, the data consisted of questions previously used to measure morale (Kutner, 1956), life satisfaction (Neugarten et al, 1961), and pre-retirement attitudes (Streib and Thompson, 1957).

The Importance of Factor Analysis

The technique known as factor analysis is applicable to a set of data when the researcher wishes to reduce the number of variables under observation. Mathematically, the original set of variables is reduced to a smaller number of categories by an analysis of the correlations among the variables. A satisfactory solution is said to yield categories (factors) which will convey the essential information of the original set of variables (Harman, 1967).

According to Rummel (1967), factor analysis tries to find the solution to the question: "What are the patterns of relationship among these data?" Since factor analysis groups data into distinct patterns of occurrence, it "is a means by which the regularity and order in phenomena can be discerned" (Rummel, 1967). In other words, it is a way to describe inter-relationships between variables through a lesser number of mathematically derived factors.

Collins (1963) states that factor analysis is "an attempt to express each of the measurements in terms of some linear combination of a lesser number of them where the new artificial measurements, or factors, are uncorrelated." It is important to note that this technique only attempts to find factors that can be linearly added thus preserving the use of original measurements rather than creating artificial ones.

Although there are a number of scientific applications for factor analysis, those important to this research are singled out for discussion here (Rummel, 1967):

1. Interdependency and pattern delineation.--When it is hypothesized that data are interrelated, factor analysis untangles the linear relationships into separate patterns. Each pattern is a distinct cluster of interrelated data.
2. Parsimony or data reduction.--By reducing data to their common factor patterns it is easier to manage, analyze and understand.

3. Scaling.--Researchers often need to develop scales on which individuals can be rated. Factor analysis presents such a scale by dividing the characteristics under investigation into factors that are independent sources of variation. Each factor is analogous to a scale based upon the empirical relationships among the characteristics.

Unfortunately for the layman, there are different types of factor analyses, and considerable opportunities for variations within them. In choosing a method for this research, a criterion that was felt to be necessary was that of "simple structure," proposed by Thurstone (1947). Essentially, simple structure means that a satisfactory factor analysis solution should result in each variable being represented by as few factors as possible.

A method that meets the assumptions of this research is known as the principal axes method with varimax rotation. This is a mathematically "pure" approach requiring no subjective judgments on the part of the researcher and which achieves a unique resolution of the original data into categories (factors).

The Study Sample

The present analysis was conducted on a sample of 123 retired workers from a large urban area in California. The subjects had been interviewed three years previously while they were still employed and the respondents to the new questionnaire had subsequently retired. All of the subjects were male and had worked for one of four basic industries: aerospace, utility, communication, and insurance (see Table 1).

A breakdown of length of retirement is shown in Table 2, where it can be seen that a majority of the respondents had been retired for more than one year.

Table 1

Sample Composition by Industry	Number Reported Retirees
Aerospace	55
Utility	39
Communication	14
Insurance	15
	123

Table 2

Length of Retirement	Number
less than one year	36
one year to two years	44
two years or more	38
did not indicate	5
	123

Results of the Factor Analysis

All of the questions used, it should be noted, have face validity as measures of life satisfaction in retirement. The task of the factor analysis was to combine these questions into their best respective linear combinations possible.

A matrix showing the results of the factor analysis on the seventeen questions thought to measure retirement adjustment is shown in Table 3. The first five columns, labeled Factors I to V, display the loadings of each of the seventeen items on each of the factors which were .30 or more. This is because a factor was interpreted on the basis of the items which had high loadings on it and usually only items which have loadings of at least .30 on a factor are included in its interpretation (Nunnally, 1967). Since the factors were rotated orthogonally the loadings of the items can be interpreted as correlation coefficients which could vary between +1.0 and -1.0, with the square of a loading indicating the proportion of variance that an item has in common with a factor. Thus the loadings indicate which variables are involved in each factor and to what degree.

The sixth column of figures in the matrix shows the communalities (h^2) for the seventeen questions. The communality for a question indicates the proportion of variation of each variable involved or which is accounted for the five factors together. It gives an indication of how well the five factors which were included in the rotation account for the variance of the questions. Only one of the communalities is below 50 percent while most are well above, indicating that a substantial proportion of variation of each question involved is accounted for by the five factors.

At the bottom of the matrix, the row Percent Total Variance, is the percent

Table 3
RETIREMENT ADJUSTMENT

ITEM	FACTOR I	FACTOR II	FACTOR III	FACTOR IV	FACTOR V	h^2
1. Would you say that you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied with your way of life today?			.36		.51	55.84
2. How much unhappiness would you say you find in life today?		.52			.36	42.38
3. I have made plans for a month or a year from now.	.40			.74		75.08
4. The things I do are as interesting as ever.	.66					54.29
5. This is just about the dreariest time of my life.		.65	.33			60.94
6. I expect some interesting and pleasant things in the future.	.41		.74			75.59
7. These are the best years of my life.	.73		.41			71.33
8. I often find a hard time keeping busy.			.76			69.64
9. As I grow older, things seem better than I thought they would be.	.68					51.08
10. I am as happy as when I was younger.	.76					65.92
11. I feel old and somewhat tired.	.52	.59				67.19
12. My life is full of worry.		.66				56.21
13. Things seem to get worse for me as I get older.		.76				70.90
14. My life could be happier than now.	.66					52.28
15. Retirement is generally bad for one.	.45			.53		60.04
16. People should retire only when they are not physically able to continue work.			.45	.54		60.96
17. Retired people do not generally get the respect they deserve from younger ones.					.79	67.20
Percent Total Variance	32.97	9.87	7.16	6.16	6.01	
Percent Cumulative Variance	32.97	42.84	50.00	56.16	62.17	

of variation among all the variables in the patterns. It can be seen that Factor I accounted for 32.97 percent of the total variance of the 17 items, Factor II for 9.87 percent, Factor III for 7.16 percent, Factor IV for 6.16 percent, and Factor V for 6.01 percent. The row, Percent Cumulative Variance, is the cumulative variance accounted for by adding successive factors, thus Factors I and II together accounted for 42.84 percent, while all factors together accounted for 62.17 percent.

Interpretation of the Factors

As was mentioned in the first section of this paper, a theoretical construct of five components--resolution and fortitude, self-concept, desired versus achieved goals, zest versus apathy, and mood tone--were thought to make up what was referred to as life satisfaction. Since the intent of this research was to identify questions which could be used in a self-report form to identify this phenomenon, it was deemed important to compare the emergent factors with the theoretical construct. The item content of each cluster should indicate which of the five components of life satisfaction is represented by each factor.

Referring again to Table 3, the following observations are made:

a) Items 4, 7, 9, 10 and 14 all correlate highly with the first factor, which appears to be Resolution and Fortitude.

b) Items 2, 5, 11, 12 and 13 correlate highly with the second factor, which appears to be the component Self-concept.

c) Items 6 and 8 correlate highly with the third factor and appear to be congruous between Desired and Achieved Goals.

d) Items 3, 15 and 16 are correlated with the fourth factor, which appears to be Zest versus Apathy.

e) Items 1 and 17 correlate highly with factor number five, which appears to be Mood Tone.

It should be noted that besides the high correlations reported, many of the items had correlations of a lesser nature but still higher than .30 with other factors. Thus, Item 1, besides correlation with factor five, also correlated with factor three (refer to Table 3). In all, nine items correlated higher than .30 with two factors. This seems to indicate that these nine individual items are useful in measuring not just one, but two components of life satisfaction.

As stated above, factor analysis can also be used in constructing scales which enable individuals to be rated. The process involves weighting those questions with the highest correlations the most and those with little or no correlation the least. An advantage of using factor scores over other methods of scoring would be that they are mathematically based on correlations and require no judgment by the researcher as to an item's contribution to the whole score.

Summary

The primary purpose of the research was to derive a self-report measure of life satisfaction in retirement. A mathematical technique known as factor analysis was applied to sample data that consisted of questions used by previous researchers to measure morale, life satisfaction, and preretirement attitudes.

Data were collected from 123 retired male workers who had been retired for an average of two years. These data were combined by factor analysis into a self-report measure of life satisfaction in retirement for the sample. The index was accepted as valid after comparing the five emergent factors--since it appeared all were represented--with theoretical constructs of the phenomenon.

It is suggested that further research be directed at validating the index against the judgments of trained psychologists.

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